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10/783,548

02/20/2004

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EXAMINER

WOLLSCHLAGER, JEFFREY MICHAEL

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Application Number: 10/783,548  
Filing Date: February 20, 2004  
Appellant(s): FOREST ET AL.

**MAILED**  
**DEC 21 2007**  
**GROUP 1700**

\_\_\_\_\_  
Richard Anderson  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed September 26, 2007 appealing from the  
Office action mailed May 22, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows: Claims 1-14 and 16-19 are pending. Claim 15 has been canceled. Claims 1-6 are withdrawn from consideration. Claims 7-14 and 16-19 stand rejected and are under review on appeal.

Appellant addressed and corrected the status of the claims with a supplement to the brief filed October 25, 2007. The supplement to the brief contains a correct statement of the status of the claims.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct. The examiner notes that the obviousness-type double patenting rejections in the final rejection improperly include claim 15 in the listing of the grounds of rejection. Claim 15 has been canceled. Appellant's statement that the obviousness-type double patenting rejections under review are the rejections of claims 7-14, 16-18 and 19 is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

WO 02/18120	WOOD et al.	3-2002
6,537,470	WOOD et al.	3-2003
5,045,251	JOHNSON	9-1991
5,567,509	GAUTIER	10-1996
6,030,575	BARRON et al.	2-2000
7,025,913	LA FOREST et al.	4-2006

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 7-18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,537,470 in view of Johnson (U.S. Patent 5,045,251). Although the conflicting claims are not identical they are not patentably distinct from each other.

Claims 1 and 2 of U.S. Patent 6,537,470 claim the basic claimed process of rapid resin or pitch transfer molding comprising placing a porous preform into a mold, the preform at a temperature above a melting point of a resin or pitch and means for containing the mold wherein the mold comprises a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, at least one gate disposed in the top half or bottom half, a valve to admit resin or pitch, and an arrangement for venting and/or providing vacuum to the mold; injecting a resin or pitch to effect impregnation and allowing the resin to cool below the melting point and removing the preform from the mold.

Regarding claim 7, claims 1 and 2 of the '470 claim the process described above, but do not expressly claim a plurality of gates/melt supply channels to effect the impregnations. However, Johnson teaches that it is conventional in the art of resin transfer molding to employ multiple inlet ports in rapid resin cure applications in order to reduce the flow distances (col. 1, lines 52-54). Therefore it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ a plurality of gates/melt channels in the top and bottom of the mold in the process of claims 1 and 2 of the '470 patent in order to reduce the distance of travel of the rapidly curing resin.

Regarding claims 8-18, claims 3-20 of the '470 patent substantially duplicate the claimed subject matter of these claims.

Claim 19 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,537,470 in view of Johnson (U.S. Patent 5,045,251) and either of Barron et al. (US 6,030,575) or Gautier (US 5,567,509). Although the conflicting claims are not identical they are not patentably distinct from each other.

Regarding claim 19, the '470 patent claims the method as set forth above, but does not claim an air, water or mist flash cooling system to cool the preform. However, Gautier discloses a method of making a preform including vacuum cooling (col. 5, lines 5-14) and Barron et al. disclose a method of making a preform wherein air flowing through the mold under vacuum affects rapid cooling (col. 8, lines 50-62; col. 11, lines 57-65). It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a flash cooling system such as is disclosed by either of Gautier or Barron et al. for the purpose, as suggested by Barron et al., of cooling the preform more rapidly

Claims 7-18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5-17 of U.S. Patent No. 7,025,913. Although the conflicting claims are not identical they are not patentably distinct from each other.

Claims 5 and 6 of U.S. Patent 7,025,913 claim the basic claimed process of rapid resin or pitch transfer molding comprising placing a porous preform into a mold, the preform at a temperature above a melting point of a resin or pitch and means for containing the mold wherein the mold comprises a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, a pair of valves in the top and bottom half of the mold to admit resin, and an arrangement for venting and/or providing vacuum to the mold; injecting a resin or pitch to effect impregnation and allowing the resin to cool below the melting point and removing the preform from the mold.

Regarding claim 7, claims 5 and 6 of the '913 patent claim the process described above, but do not claim the mold cavity is annular. However, the selection of the shape of the mold cavity would have been readily chosen by and obvious to the ordinarily skilled artisan in order to achieve the production of an intended product.

Regarding claims 8-18, claims 7-17 of the '913 patent substantially duplicate and/or render obvious the claimed subject matter.

Claims 19 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 5-17 of U.S. Patent No. 7,025,913 in view of either of Barron et al. (US 6,030,575) or Gautier (US 5,567,509). Although the conflicting claims are not identical they are not patentably distinct from each other.

Regarding claim 19, the '913 patent claims the method as set forth above, but does not claim an air, water or mist flash cooling system to cool the preform. However, Gautier discloses a method of making a preform including vacuum cooling (col. 5, lines 5-14 and Barron et al. disclose a method of making a preform wherein air flowing through the mold under vacuum affects rapid cooling (col. 8, lines 50-62; col. 11, lines 57-65). It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a flash cooling system such as is disclosed by either of Gautier or Barron et al. for the purpose, as suggested by Barron et al., of cooling the preform more rapidly.

Claims 7-14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wood et al. (U.S. Patent 6,537,470 or WO 02/18120) in view of Johnson (U.S. Patent 5,045,251).

Regarding claim 7, Wood et al. teach a process of rapid resin or pitch transfer molding comprising placing a porous preform into a mold wherein the preform is at a temperature above a melting point of a resin or pitch and means for containing the mold wherein the mold comprises a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, at least one gate disposed in the top half or bottom half, a valve to admit

resin or pitch, and an arrangement for venting and/or providing vacuum to the mold; injecting a resin or pitch to effect impregnation and allowing the resin to cool below the melting point and removing the preform from the mold wherein the mold cavity is annular and the top and bottom half include an annular groove (Figure 5, 6 and 10; col. 4, lines 24-32; col. 8, lines 59-62; col. 9, lines 1-col. 10, lines 27). Wood et al. do not disclose a plurality of melt channels in the top and bottom half (example: Figure 10). However, Johnson teaches that it is conventional in the art of resin transfer molding to employ multiple inlet ports in rapid resin cure applications in order to reduce the flow distances (col. 1, lines 52-54).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a plurality of gates/melt channels in the top and the bottom of the mold while practicing the method disclosed by Wood et al., in view of Figure 10 for example in the patent to Wood et al., as taught and suggested by Johnson in order to reduce the distance the rapidly curing resin needed to travel.

As to claim 8, Wood et al. disclose the claimed materials (col. 20, lines 3-7).

As to claim 9, Wood et al. disclose the preform is a porous carbon body (col. 20, lines 19-21).

As to claim 10, Wood et al. disclose the preform may be used as a brake disc in an aircraft (col. 11, line 20).

As to claims 11 and 12, Wood et al. disclose the claimed temperatures (col. 20, lines 26-31).

As to claim 13, Wood et al. disclose the same claimed resins or pitch (col. 20, lines 32-39).

As to claim 14, Wood et al. place multiple preforms in a single mold (Figures 3, 9, and 10).



As to claim 16, Woods et al. oxidize and carbonize the preform at the claimed temperature (col. 20, lines 43-58).

As to claim 17, Wood et al. employ CVD/CVI or resin transfer molding (col. 20, lines 59-62).

As to claim 18, Wood et al. employ a vacuum (col. 20, lines 63-65).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wood et al. (U.S. Patent 6,537,470 or WO 02/18120) in view of Johnson (U.S. Patent 5,045,251) and further in view of either of Barron et al. (US 6,030,575) or Gautier (US 5,567,509).

Regarding claim 19, Wood et al. teach a process of rapid resin or pitch transfer molding comprising placing a porous preform into a mold wherein the preform is at a temperature above a melting point of a resin or pitch and means for containing the mold wherein the mold comprises a top half, a bottom half opposed to the top half so that the top half and the bottom half form a mold cavity, at least one gate disposed in the top half or bottom half, a valve to admit resin or pitch, and an arrangement for venting and/or providing vacuum to the mold; injecting a resin or pitch to effect impregnation and allowing the resin to cool below the melting point and removing the preform from the mold wherein the mold cavity is annular and the top and bottom half include an annular groove (Figure 5, 6 and 10; col. 4, lines 24-32; col. 8, lines 59-62; col. 9, lines 1-col. 10, lines 27). Wood et al. do not disclose a plurality of melt channels in the top and bottom half (example: Figure 10). Wood et al. also do not disclose an air, water or mist flash cooling system.

However, Johnson teaches that it is known in the art of resin transfer molding to employ multiple inlet ports in rapid resin cure applications in order to reduce the flow distances (col. 1, lines 52-54), Gautier discloses a method of making a preform including vacuum cooling (col. 5,

lines 5-14) and Barron et al. disclose a method of making a preform wherein air flowing through the mold under vacuum affects rapid cooling (col. 8, lines 50-62; col. 11, lines 57-65).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a plurality of gates/melt channels in the top and the bottom of the mold while practicing the method disclosed by Wood et al., in view of Figure 10 for example in the patent to Wood et al., as taught and suggested by Johnson in order to reduce the distance the rapidly curing resin needed to travel. Further, it would have been obvious to one having ordinary skill in the art at the time of the claimed invention to have employed a flash cooling system such as is disclosed by either of Gautier or Barron et al. for the purpose, as suggested by Barron et al., of cooling the preform more rapidly

#### **(10) Response to Argument**

Appellant's argument essentially alleges that the examiner has failed to establish a *prima facie* case of obviousness because the combination of references does not teach or suggest a rapid resin or pitch transfer molding process wherein a plurality of melt supply channels is disposed in the top half and in the bottom half of the mold.

As a preliminary manner, the examiner notes that both US 6,537,470 and WO 02/18120 (collectively "Wood") have been applied as alternative primary references in the rejection. These documents are from the same patent family. The WIPO document claims priority to the patent application that became the '470 patent. Both documents are substantially identical and contain the same relevant subject matter. The '470 patent was cited because the reference was provided in the IDS and because an obviousness type double patenting rejection was made over the '470 patent. The '470 patent constitutes prior art under 35 USC 102(a) and 35 USC

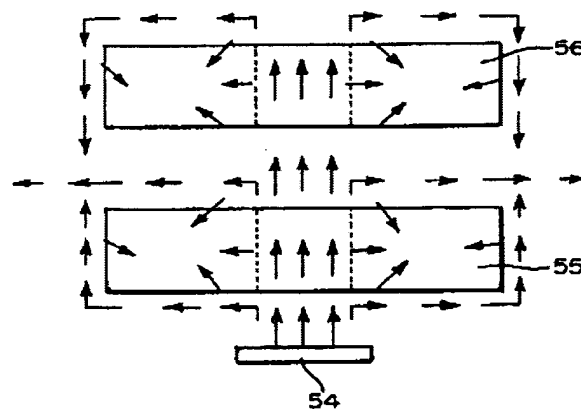
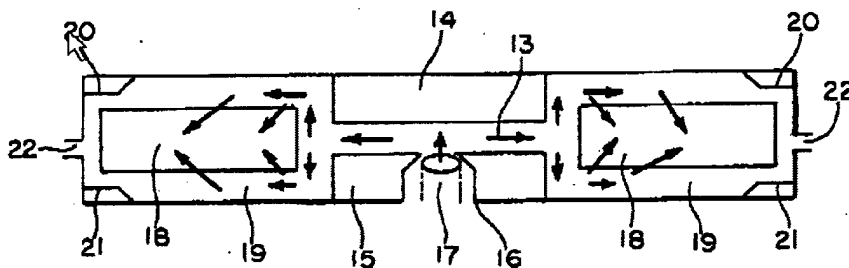
102(e). The WIPO document is prior art under 35 USC 102(b). All citations to "Wood" in the rejection are from the '470 patent.

A. Regarding the rejection of claims 7-14 and 16-18 over Wood in view of Johnson, Appellant argues that the mold employed by Johnson is completely different than the mold employed by Wood and that Johnson does not make it obvious to modify Wood's mold such that a "plurality of melt supply channels is disposed in the top half and in the bottom mold half of the mold".

This argument is not persuasive. As an initial matter, the examiner notes that Wood is directed to a rapid resin or pitch transfer molding process (preamble of claim 7; Abstract) that comprises incorporating high viscosity resin or pitch into fibrous preforms. Johnson is directed to a resin transfer molding process that comprises incorporating resin into fibrous preforms (Abstract). The examiner submits the references are clearly analogous. Further, the examiner notes that the combination set forth by the examiner does not intend to employ Johnson's mold structure, but the pertinent transfer molding teaching that are applicable to the Wood reference. This teaching of Johnson, and not Johnson's mold shown in the Figure, is used to modify the Wood mold/process to render the claims obvious.

Regarding which molds of Wood are modified by the combination, the examiner notes that the Figure 3 and Figure 10 molds of Wood are the molds employed by the examiner as the molds most obvious to modify with the teaching of Johnson. Appellant has referenced and included a copy of Figure 4 from Wood. While the examiner submits that modifying the mold of Figure 4 would also be obvious in view of the teaching of Johnson, this is not the mold the examiner has proposed to modify.

Referring to Figure 3 from Wood, it is noted that preforms (18) are in the process of being embedded with resin or pitch entering through one port/gate (17). Referring to Figure 10, a stacked configuration is shown wherein a plurality of preforms are being embedded with resin or pitch through one port/gate (54).



Accordingly, as set forth in the rejection and as is not disputed by the examiner, Wood only teaches one melt supply channel and does not teach a plurality of melt supply channels in the upper half and the lower half of the mold as required by the claims. However, the examiner

notes that it should be remembered that the arrows in Figure 3 and Figure 10 of Wood are showing the movement of a highly viscous and rapidly densifying resin or pitch material as it is embedding fibrous preforms (i.e. resin transfer molding process).

With Figure 3 and Figure 10 from Wood in view, the examiner points to Johnson who teaches that in processes of embedding fibrous preforms with resin (i.e. resin transfer molding processes):

"Due to the rapid resin cure, flow distances are limited and for longer flow distances multiple inlet ports may be required." (col. 1, lines 52-54).

Johnson further teaches that:

"It will be apparent that the number and placement of the resin-in and air-out passages will be a matter within the ability of those skilled in the art of resin transfer molding given the present disclosure." (col. 6, lines 64-67).

Accordingly, the examiner submits that one having ordinary skill in the art at the time of the claimed invention, in view of the teaching of Johnson to provide multiple inlet ports, would have found it obvious to have modified, for example, either Figure 3 or Figure 10 of Wood, by providing a plurality of inlets in both the top and bottom portions of the mold for the purpose of reducing the flow distances of Wood's highly viscous and rapidly densifying resin or pitch material.

Further, it is noted that Wood states that it is desirable to provide efficient distribution of the resin throughout the preform and that dry pockets caused by incomplete impregnation are

undesirable (col. 3, line 45-col. 4, line 32). The application of multiple inlet ports, as suggested by Johnson, further helps to promote these stated goals of Wood.

Additionally, in view of the teaching of Johnson that "the number and placement of the resin-in and air out passages will be a matter within the ability of those skilled in the art of resin transfer molding", the examiner submits and concludes that determining the precise number and placement of the melt supply channels would have been readily determined by the artisan through routine experimentation. As there is no evidence of new or unexpected results, the examiner submits this teaching of Johnson when combined with Wood also renders the claims obvious.

B. Regarding the rejection of claim 19 over Wood in view of Johnson and either of Barron or Gautier, Appellant argues that neither Barron nor Gautier remedies the deficiencies of the Wood and Johnson references. Additionally, neither Barron nor Gautier teach flash cooling as required by the claim.

This argument is not persuasive. The examiner notes that claim 19 contains the same limitations as claim 7 with an additional limitation regarding flash cooling. As set forth above, Woods in view of Johnson render claim 7 obvious. As such, the only limitation not taught or suggested by the combination of Woods in view of Johnson is a teaching regarding flash cooling. This deficiency is remedied by either of Barron or Gautier.

The examiner notes that flash cooling is very generically disclosed in the instant specification and only appears to suggest that flash cooling involves increasing the rate of cooling. This interpretation is further supported by the REMARKS filed on February 28, 2007 which states that "flash cooling involves rapidity" (page 6, lines 15-16). Accordingly, the examiner submits that both Barron and Gautier disclose methods of actively cooling

impregnated preforms (i.e. rapidly). Gautier discloses a method of making a preform including vacuum cooling (col. 5, lines 5-14) and Barron et al. disclose a method of making a preform wherein air flowing through the mold under vacuum effects rapid cooling (col. 8, lines 50-62; col. 11, lines 57-65).

While it is clear that appellant appears to associate more inherent limitations with the term "flash cooling" than the examiner, the examiner notes that it is unclear what these limitations are and how they are not taught by either of Gautier or Barron et al. The examiner concludes that under a reasonable interpretation of the term, both Gautier and Barron et al. individually teach a method of cooling commensurate in scope with the recitation "flash cooling" because they employ the same materials disclosed for flash cooling in the claim and specification (e.g. water, air, vacuum) and their cooling method increases the rapidity of the cooling.

C. Regarding the obviousness type double patenting rejection of claims 7-14 and 16-18 over Wood in view of Johnson, Appellant argues that for the same reasons set forth in section A. above, the combination does not teach or suggest a method such that a "plurality of melt supply channels is disposed in the top half and in the bottom mold half of the mold".

This argument is not persuasive. The examiner points to the same response to arguments set forth in section A. above. It is the examiner's position that the double patenting rejection over Wood in view of Johnson stands or falls with the art rejection of Wood in view of Johnson for the same reasons set forth above in Section A.

D. Regarding the obviousness type double patenting rejection of claim 19 over Wood in view of Johnson and either of Barron or Gautier, Appellant argues that for the same reasons set forth in section B above, the combination does not teach or suggest a method such that a

"plurality of melt supply channels is disposed in the top half and in the bottom mold half of the mold" or a "flash cooling" process.

This argument is not persuasive. The examiner points to the same response to arguments set forth in section B. above. It is the examiner's position that the double patenting rejection over Wood in view of Johnson and either of Barron or Gautier stands or falls with the art rejection for the same reasons set forth above in Section B.

E. Regarding the obviousness type double patenting rejection of claims 7-14 and 16-18 over La Forest '913 and claim 19 over La Forest '913 in view of either of Barron or Gautier, Appellant argues that La Forest '913 does not claim, nor do the claims render obvious, a plurality of melt supply channels disposed in the bottom half and top half of the mold and an annular mold cavity.

This argument is not persuasive. The examiner agrees that La Forest '913 does not claim an annular mold. However, the examiner submits that the selection of the shape of the mold cavity would have been readily chosen by and obvious to the ordinarily skilled artisan in order to produce an intended product having a desired shape, as is routinely practiced in the molding arts. Further, La Forest '913 claims (claim 6) that the mold comprises "a pair of valves, wherein the valves can admit resin or pitch into the melt supply channels in the top half and the bottom half of the mold". The examiner submits that from this claim limitation it would have been obvious to have duplicated melt supply channels in the top half and bottom half of the mold in order to admit resin or pitch into the top half and bottom half of the mold. Accordingly, the examiner submits that the rejection is proper.



Application/Control Number:  
10/783,548  
Art Unit: 1791

Page 16

**(11) Related Proceeding(s) Appendix**

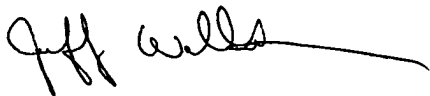
No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

Application/Control Number:  
10/783,548  
Art Unit: 1791

Page 17

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Jeff Wollschlager", with a long horizontal flourish extending to the right.

Jeff Wollschlager  
Examiner, Art Unit 1791

Conferees:

A handwritten signature in black ink, appearing to read "Christina Johnson", with a stylized flourish.

Christina Johnson  
SPE, Art Unit 1791

/Jennifer Michener/

Jennifer Michener  
Quality Assurance Specialist, TC1700